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PROTOCOL FOR THE INVESTIGATION OF ACUTE FLACCID PARALYSIS AND SUSPECTED PARALYTIC POLIOMYELITIS*

Paralytic poliomyelitis has been nationally notifiable in Canada since 1924. The last case of indigenous wild paralytic poliomyelitis in Canada occurred in 1977, and Canada, along with the rest of the American Region, was formally certified as polio-free by the International Commission for the Certification of Poliomyelitis Eradication in September 1994[1]. Despite the elimination of indigenous wild poliovirus transmission, however, it remains essential that surveillance be maintained until global eradication is achieved because of the risk of wild virus importation from endemic regions. Paralytic poliomyelitis cases resulting from wild virus importations were reported in Canada in 1978 and 1988[2,3]. Two other recognized instances of wild virus importation in 1993 and 1996 were not associated with paralytic (or nonparalytic) illness[4,5]. The sensitivity of the previous passive surveillance system for poliomyelitis in Canada has been limited in recent years by the low index of diagnostic suspicion and the false sense of security that often occurs when a disease becomes rare. Thus, active surveillance of acute flaccid paralysis (AFP) in children < 15 years old was initiated in 1991 to screen for potential cases of poliomyelitis. AFP surveillance formed a critical component of the polio eradication campaign in the Americas and continues to play an essential role in the World Health Organization global polio eradication campaign[6]. By using an expected annual background incidence of approximately one case of AFP per 100,000 in the population < 15 years old in the absence of wild poliovirus transmission[1], AFP surveillance serves as a good indicator of the level of monitoring for potential cases of paralytic poliomyelitis from imported virus into polio-free regions. Further, with proper laboratory and neurologic investigation of cases, AFP surveillance greatly improves the sensitivity for rapid detection of paralytic poliomyelitis. AFP surveillance in Canada is being implemented through a collaborative effort between the Laboratory Centre for Disease Control (LCDC) and the Canadian Paediatric Surveillance Program. Surveillance is based on reporting through the Immunization Monitoring Program, Active system, a network of 11 pediatric tertiary-care centres across the country, as well as reporting by pediatricians. All suspected cases of paralytic poliomyelitis reported to LCDC are evaluated by the national Working Group on Polio Eradication to rule out or confirm the diagnosis.

This protocol provides guidelines for investigating all suspected cases of paralytic poliomyelitis of any age, as well as AFP cases in patients < 15 years old. All suspected cases of paralytic poliomyelitis that meet the reporting criteria in this protocol (or additional local reporting criteria) should be reported according to the procedures outlined (see the section below on Investigation and Reporting of Cases) to provincial or territorial public-health authorities for notification to LCDC. Guidelines are also provided for reporting the incidental finding of wild strain poliovirus, with or without any clinical symptoms (see the section below on Reporting of Incidental Finding of Wild Poliovirus).

All acute flaccid paralysis cases < 15 years old should be investigated to rule out poliomyelitis. Refer to the section below on Surveillance Case Definition.

All suspected cases of paralytic poliomyelitis, regardless of age, should be reported to public-health authorities as outlined in the section below on Investigation and Reporting of Cases.

The incidental finding of wild strain poliovirus, with or without clinical symptoms, should be reported as outlined in the section below on Reporting of Incidental Finding of Wild Poliovirus.

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Surveillance Case Definitions

AFP: For surveillance purposes, AFP is defined as acute onset of focal weakness or paralysis characterized as flaccid (reduced tone), without other obvious cause (e.g. trauma) in children < 15 years old. Transient weakness (e.g. postictal weakness) should not be reported.

Paralytic poliomyelitis: The following case definitions are based on national surveillance case definitions, published by the Advisory Committee on Epidemiology (ACE) and LCDC in 1991[7], which were in use when the protocol was published. However, these case definitions are under review by ACE; therefore, the most recent definition available should always be used and inserted in the protocol.

Confirmed case: A confirmed case is identified by clinically compatible signs and symptoms of paralytic poliomyelitis (AFP of one or more limbs, decreased or absent tendon reflexes on affected limbs, no persistent sensory or cognitive loss, no other apparent cause, and neurologic deficit present 60 days after onset of initial symptoms unless the patient has died), associated with the isolation of vaccine or wild poliovirus from a clinical specimen.

Possible case: A possible case is indicated by clinically compatible signs and symptoms of paralytic poliomyelitis (as listed above), without isolation of poliovirus from clinical specimens, with serologic evidence of recent poliovirus infection, and without evidence for infection with other neurotropic viruses. Serologic evidence of recent poliovirus infection is provided by a fourfold or greater rise in poliovirus antibody titre in paired sera and/or the presence of poliovirus-specific immunoglobulin (Ig) M antibody.

Investigation and Reporting of Cases

The following describes the protocol to follow during the investigation of suspected cases. These steps are outlined in Figure 1.

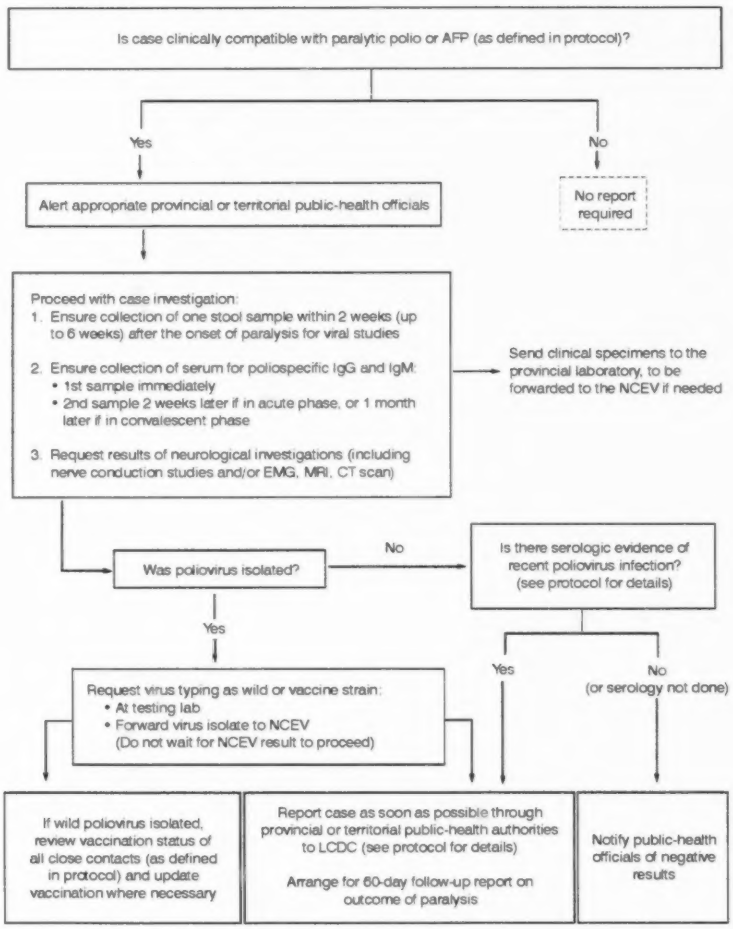
Step A

Is the case clinically compatible with paralytic poliomyelitis or AFP as defined above?

If no – No further investigation or report is required.

If yes – Alert the appropriate provincial or territorial public health authorities that a

Figure 1
Steps for investigating and reporting suspected cases of paralytic polio or acute flaccid paralysis


Is case clinically compatible with paralytic polio or AFP (as defined in protocol)?
Yes
No
Alert appropriate provincial or territorial public-health officials
No report required
Proceed with case investigation:
1. Ensure collection of one stool sample within 2 weeks (up to 6 weeks) after the onset of paralysis for viral studies
2. Ensure collection of serum for poliospecific IgG and IgM:
• 1st sample immediately
• 2nd sample 2 weeks later if in acute phase, or 1 month later if in convalescent phase
3. Request results of neurological investigations (including nerve conduction studies and/or EMG, MRI, CT scan)
Send clinical specimens to the provincial laboratory, to be forwarded to the NCEV if needed
Was poliovirus isolated?
No
Is there serologic evidence of recent poliovirus infection? (see protocol for details)
Yes
Yes
No (or serology not done)
Request virus typing as wild or vaccine strain:
• At testing lab
• Forward virus isolate to NCEV
(Do not wait for NCEV result to proceed)
If wild poliovirus isolated, review vaccination status of all close contacts (as defined in protocol) and update vaccination where necessary
Report case as soon as possible through provincial or territorial public-health authorities to LCDC (see protocol for details)
Arrange for 60-day follow-up report on outcome of paralysis
Notify public-health officials of negative results

Legend

AFP	Acute flaccid paralysis
CT	Computed tomography
EMG	Electromyography
Ig	Immunoglobulin
LCDC	Laboratory Centre for Disease Control
MRI	Magnetic resonance imaging
NCEV	National Centre for Enteroviruses

suspected case of paralytic poliomyelitis (or AFP case) is under investigation. Proceed to Step B.

Step B

Ensure collection of one stool sample within 2 weeks after the onset of paralysis for viral studies. (The sample may be collected up to 6 weeks after onset of paralysis.)

Note: A stool sample, taken at the time(s) as specified above, is the most important clinical specimen for the laboratory investigation and diagnosis of poliomyelitis. A stool sample is preferred to a rectal swab because the laboratory diagnosis of poliovirus is more reliable. However, in the absence of a stool sample, fecal material obtained by a rectal swab (or similar rectal examination) is acceptable.

Ensure that a serum specimen is taken immediately for polio serology. A second specimen should be taken 2 weeks later if the patient presents in the acute phase of the illness or 1 month later if the patient presents in the convalescent phase. Samples should be tested in parallel for poliovirus antibody titres, and polio-specific IgG and IgM evaluations.

Note: Stool and serum specimens should be forwarded to the provincial laboratory to avoid unnecessary cost to specific health institutions and ensure that all the appropriate investigations for poliovirus (or other enteroviruses) are done. Specimens should be forwarded by provincial laboratories to the National Centre for Enteroviruses for further investigation when needed.

Request results of neurologic investigations including nerve conduction studies and/or electromyography, magnetic resonance imaging, and computed tomography scan.

Step C

Evaluate the results of the laboratory investigations outlined above, and proceed accordingly.

If poliovirus is isolated, request results of typing (as vaccine strain or wild strain) from the testing laboratory. The reporting health unit, in liaison with the testing laboratory, should ensure that all polio virus isolates are forwarded to the National Centre for Enteroviruses for further typing and strain differentiation. Proceed to Step D without waiting for results from the National Centre for Enteroviruses.

If poliovirus is not isolated but there is serologic evidence of recent poliovirus infection (i.e. a fourfold or greater rise in poliovirus antibody titre in paired sera and/or the presence of poliovirus-specific IgM antibody), proceed to Step D.

Note: If poliovirus is not isolated and there is no serologic evidence of recent poliovirus infection (including tests not done, specimens inadequate or negative results), proceed to Step D and inform appropriate provincial or territorial public-health authorities of the outcome of investigations. Cases clinically compatible with paralytic poliomyelitis should be reported as "suspected cases".

Step D

Report the case as soon as possible to provincial or territorial public-health authorities. Indicate the case as confirmed or possible polio, if the respective case definitions presented here are met. A clinically compatible case with no laboratory evidence of poliovirus infection (or incomplete laboratory investigations) should be reported as a suspected case.

The following information should be sought and included in the report for each case.

Information relating to patients should include

- date of birth and gender
- polio immunization status (total number of doses of oral and/or injection polio vaccine received)
- receipt of oral polio vaccine within 30 days before the onset of illness
- travel history within 30 days before the onset of illness
- summary of the clinical presentation, course of illness and final clinical diagnosis
- results of stool culture and serologic tests (if any of the required clinical specimens were not available for testing, this should be indicated in the report)
- results of electromyography and/or nerve conduction studies, if available (indicate if tests were not done).

Information relating to household contacts should include

- receipt of oral polio vaccine within 90 days before the onset of illness in the case
- travel history within 30 days before the onset of illness in the case.
- Health Canada reporting forms, *Common Case Report Form A (HPB 5130A)* and *Poliomyelitis Case Report Form E (HPB 5130E)*, provide the full details of the information required and should be used for reporting.

Make arrangements for follow-up assessment of the outcome of paralysis 60 days after its onset. A follow-up report should be submitted when the information is available.

Note: The initial report should not be delayed because of incomplete information; however, all relevant information should be sent in a follow-up report as soon as it is available.

Management of Close Contacts

If wild poliovirus is isolated from a clinical specimen, the polio immunization status of close contacts of the case should be reviewed and their immunization updated, if needed.

Close contacts of a case are defined as

- household contacts – persons living in the same house or having close contact with the case (e.g. sharing sleeping arrangements or playing together for ≥ 4 hours) within 30 days before the case's onset of illness
- day-care attendees
- persons having contact with stools or fecal matter of the case within 30 days before the patient's onset of illness, without using infection control precautions.

These guidelines apply to isolated cases of suspected or confirmed paralytic poliomyelitis or the incidental finding of wild poliovirus with paralysis.

The investigation of a cluster of cases as part of an outbreak should be reviewed by local and appropriate provincial or territorial public-health authorities to determine the extent of contact investigation.

Reporting of Incidental Finding of Wild Poliovirus

The incidental finding of wild strain poliovirus in a clinical specimen, with or without clinical signs and symptoms of poliomyelitis, should be reported to local and appropriate provincial or territorial public-health authorities according to the procedures outlined in Step D above.

The polio immunization status of close contacts should be reviewed and their immunization updated, if needed.

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Source: *Working Group on Polio Eradication (Drs J Carlson [Chairperson], A Bell, N Cashman, P Duclos, S Lee, V Marchessault, L Palkonyay, Y Robert, J Waters); A Bentsi-Enchill, MB, ChB, MSc, Division of Immunization, Bureau of Infectious Diseases, LCDC, Ottawa, ON.*

RESPIRATORY VIRUS SURVEILLANCE
FluWatch Project

FluWatch, Canada's influenza surveillance program, now in its second season, began on 15 October 1997. The program collects, synthesizes, and reports data from four main sources: sentinel physician reporting of influenza-like illness (ILI); provincial and territorial assessments of influenza activity based on various indicators, including physician reporting and sickness absence data; laboratory reports of positive influenza tests; and World Health Organization and other international reports of influenza activity. ILI is defined as an acute febrile (fever and or chills) respiratory illness characterized by one or more of the following: cough, sore throat, arthralgia, myalgia, or prostration which, in the opinion of the attending physician, could be due to influenza virus. This update summaries influenza activity until 21 January 1998.

This year FluWatch has enrolled 200 sentinel physicians representing 131/288 (46%) census divisions in Canada. The physician response rate varies by province and by week. The mean response rate is 53% (29% to 68%). Figure 1 illustrates the standardized rates of ILI by province for this season's FluWatch. Newfoundland, Saskatchewan, and Alberta have had the highest rates to date. The standardized rates of ILI reported to FluWatch (Figure 2) during the current season are relatively constant, and do not show the peak in activity over the holiday season that was observed for the 1996-1997 season. The highest rate of ILI, to date, has been in the < 10-year-old age group (115 per 1,000 patients seen).

Figure 1
Standardized rates of ILI across Canada, by province, reported to FluWatch, 15 October 1997 - 20 January 1998

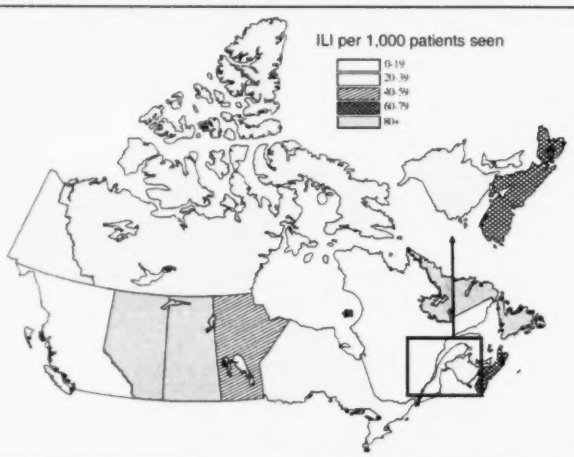
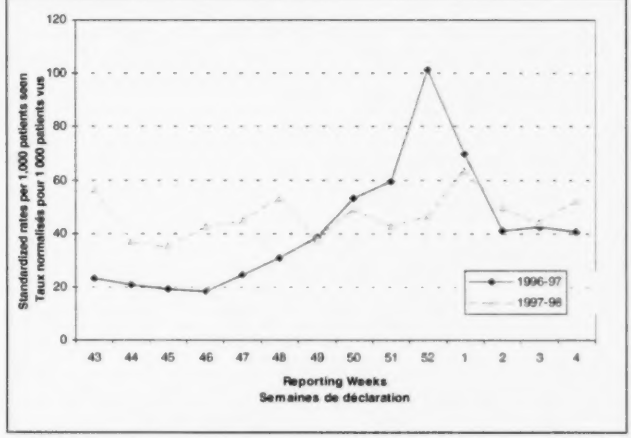


Figure 2
Standardized rates of reported ILI across Canada, by week, reported to FluWatch, 15 October 1996 - 20 January 1997 and 15 October 1997 - 20 January 1998



The first influenza isolate this season was identified as A/Wuhan/359/95(H3N2), and was submitted by Quebec. As of 16 January, 1998 we have received reports on 11,110 laboratory tests for influenza. Of these, 226 are confirmed as influenza A and four as influenza B. The distribution of influenza A is as follows: Nova Scotia (6); New Brunswick (2); Quebec (73); Ontario (134); Manitoba (6); Alberta (2); and British Columbia (3). FluWatch reports, published every 2 weeks, can be accessed through the FluWatch Website: **http://www.hc-sc.gc.ca/hpb/lcdc/bid/dsd/fluwatch/index.html**.

Influenza A(H5N1) ("bird flu" or "avian flu") is a newly discovered virus affecting humans, previously known to infect only birds. It was first isolated from a human case in Hong Kong in 1997. As of 19 January, 1998 there were 18 confirmed human cases, with six deaths and one suspected case, all residents of Hong Kong Special Administrative Region. The onset date of the last confirmed case was 28 December, 1997. Up-to-date information can be obtained from the Hong Kong Department of Health Website: **http://www.info.gov.hk/dh/new/bullet.htm**. Information can also be obtained from the Infectious Diseases News Brief Website: **http://www.hc-sc.gc.ca/hpb/lcdc/bid/dsd/news/index.html.**

Source: *P Buck, DVM, MSc, Field Epidemiologist, S Herman, C Scott, B Winchester, BSc, MSc, P Zabchuk, P Sockett, PhD, Chief, Division of Disease Surveillance, Bureau of Infectious Diseases; M Vanderkloot, BA, Bureau of Surveillance and Field Epidemiology, LCDC, Ottawa,ON.*

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Scientific Advisors	Dr. John Spika	(613) 957-4243
	Dr. Fraser Ashton	(613) 957-1329
Editor-in-Chief	Eleanor Paulson	(613) 957-1788
Assistant Editor	Nicole Beaudoin	(613) 957-0841
Desktop Publishing	Joanne Regnier	

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